

REMARKS

In the Action mailed August 9, 2005, claims 1 and 3-17 were rejected under 35 USC §102(b) for allegedly being anticipated by U.S. Patent 5,087,099 to Stolarczyk.

Claim 2 was rejected under 35 U.S.C. §103(a) for alleged obviousness over the '099 patent.

Claim 18 was rejected under §103(a) for alleged obviousness over the '099 patent to Stolarczyk in view of U.S. Patent 5,029,943 to Merriman.

In view of the clarifications expressed herein, it is respectfully submitted that all claims 1-18 are in condition for allowance.

A. Rejection of Claims 1 and 3-17 Under § 102(b)

In support of this rejection, the Office repeated, its previous arguments asserted for the rejection made in the previous Office Action.

It is respectfully submitted that the Office is not recognizing an important distinction between the pending claims and the cited art, i.e. U.S. Patent 5,087,099 to Stolarczyk.

The pending claims recite a face support control system for a face support that includes several support shields, each equipped with a control device. The claims further recite that the control system includes a communication system for transmitting data between the control devices in the face and the face master control located outside the face. A significant and novel feature of the claimed subject matter is that the communication system comprises radio transmission devices, each having receiver and transmitter modules used to perform wireless and cable-free data transmission between the face and outside the face. And, it is significant that the data transmission is bi-directional. This data transmission is between the face, i.e. the region underground at which mining is being performed, and outside the face, such as on the surface. See paragraph 0016 in the present application. It is respectfully submitted that a face support control system using wireless, cable-free, bi-directional data transmission between the face and outside the face is novel.

All pending claims recite that the communication system comprises radio transmission devices each having receiver and transmitter modules for carrying out wireless and cable-free bi-directional data transmission between the control devices in the face and the face master control outside the face.

In contrast, the '099 patent relates to a system which transmits signals by inductive coupling of a transmitter and a receiver through a utility conductor such as a cable. See for example, the Abstract; col. 3, lines 34-37; col. 7, lines 26-36; col. 8, line 4; and col. 12, lines 23-28. The utility conductor or cable is depicted in Figure 7 as item 200. Thus, the control system of the '099 patent is not "cable-free."

Furthermore, according to column 3, beginning at line 20, of the '099 patent, the sensors which are monitored by the receivers, are used to monitor machine, geological or environmental parameters in the mining environment. Thus, according to the '099 patent, that system only provides one-way communication and not "bi-directional" communication.

Further support that the '099 patent does not describe bi-directional communication is that the sensors and transmitters are controlled by a sleep-timer interface which only spontaneously and periodically activates the transmitters and initiates the transmission of multiple short duration bursts, see col. 4, line 64 to col. 5, line 22.

In summary, the '099 patent to Stolarczyk fails to disclose "wireless and cable-free" data transmission between control devices in the face and the face master control outside the face. Instead, the system of Stolarczyk transmits data by inductive coupling along a utility conductor such as a cable. This is shown in Figure 7 as conductor 200. Claim 1 specifically recites that the data transmission is "wireless and cable-free." Furthermore, the '099 patent fails to disclose that the data transmission between control devices in the face and the face master control outside the face is "bi-directional" as expressly recited in claim 1. Independent claims 6 and 13 have been clarified to expressly recite that the face master control is "outside the face" to parallel the language in claim 1.

In the previous Office Action, the Office commented on the explanations provided by Applicant in the previous Response. Specifically, the Office asserted in regard to those explanations that:

Applicant's arguments filed 5/18/05 have been fully considered but they are not persuasive. Applicant has argued that the primary reference fails to teach a wireless and cable-free system and also fails to teach the bi-directional data transmission.

With regards to the term "wireless" see the title of the Stolarczyk patent.

The term "wireless" as used in the title of the '099 patent refers to a portion of the system, located in the mine, in which small data transmission units (such as 88 and 92 in FIG. 2) transmit information to an electrical conductor 98 (see FIG. 2). Only a minor

portion of the overall signal path is “wireless”, i.e. the path from antenna 100 to conductor 98. And, this signal path is located entirely underground, and not between control devices in the face and the face master control outside the face, as recited in all pending claims.

Applicant does not dispute that in certain regions underground, along the face, “wireless” data transmission can occur in the system disclosed by the ‘099 patent. However, that is not the specific aspect recited in the pending claims. Instead, the pending claims recite that the data transmission between the control devices in the face and the face master control outside the face, is wireless and cable-free. This language excludes the cable-based system, i.e. cable 200 in Fig. 7 of the ‘099 patent.

The Office continued and asserted:

With regards to the term “cable-free”; see, e.g. col. 5, lines 37-42 of Stolarczyk:

“electrical conductor 98 which can be for example, a utility conductor such as an AC power cable, a wire rope, a telephone or other communication cable, a water pipe or a conveyor belt structure.”

Although Stolarczyk discloses a cable, the reference clearly teaches cable-free transmission (i.e. using a pipe or conveyor structure).

The term “cable-free” as described in the cited passage of the ‘099 patent only refers to the signal path between an antenna 36 and the electrical conductor 98 (see FIG. 2 of the ‘099 patent) which, as previously described, is located entirely underground. The remaining portion of the signal path in the ‘099 patent is in fact, cable-based. In contrast, all pending claims recite “wireless and cable-free” data transmission between control devices in the face and the face master control outside the face.

Applicant does not dispute that in certain limited regions underground, along the face, “cable-free” data transmission can occur in the system disclosed by the ‘099 patent. However, that is not the specific aspect recited in the pending claims. Instead, the use of the term “cable-free” in the pending claims distinguishes the claims from the system described in the ‘099 patent since that system relies upon the use of the electrical conductor 98, i.e. a cable, for control data transmission.

The Office continued and contended:

With regards to the “bi-directional” data transmission; see col. 6, lines 32-43:

“FIG. 4 shows the longwall shield 96 in more detail. A horizontal hydraulic ram 136 mechanically connects the longwall shield 96 to a pan line 138. A vertical hydraulic ram 140 is mechanically connected between a shield base 142 and a shield roof support 146. A roof support automation control unit (RSACU) 148 is attached to the shield 96. The RSACU 148 and the MACU 125 comprise electronic components equivalent to those

contained in the central receiver unit 102. Specifically, a microcomputer, a **transceiver**, a minimal phase shift key modem, an input-output port and an antenna as is shown in more detail in FIG. 8." (emphasis added)

A transceiver is used for bi-directional data transmission. See also the abstract:

"data can be communicated between a remote location and a surface area by utilizing a system of repeaters inductively coupled to a utility conductor. Use of the repeater system permits operation of mining machines from a surface computer".

The passage cited by the Office in regards to the term "bi-directional" data transmission, refers to a roof support automation control unit 148 at the face having an ability to undergo bi-directional communication with another component also located at the face, such as a transceiver 152 (see col. 12, lines 9-11). Although, in the cited passage, communication between a "remote location" and the surface is noted, that disclosure also notes that the communication is by inductive coupling using a utility conductor.

The pending claims exclude the system disclosed in the '099 patent. The claims all recite a control system having a communication system with radio transmission devices each having receiver and transmitter modules for carrying out wireless and cable-free bi-directional data transmission between control devices in the face and a face master control outside the face. The '099 patent fails to disclose these aspects.

For at least these reasons, it is respectfully submitted that all pending claims are in condition for allowance.

B. Rejection of Claim 2 Under § 103(a) Should Be Withdrawn

Here, the Office asserted:

Stolarczyk fails to explicitly disclose the transmission device on the face edge. Absent any showing of unexpected results, the precise placement of the device is deemed to be obvious to one of ordinary skill in the art.

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Claim 2 depends from independent claim 1. Claim 2 recites many more aspects than just the arrangement of the first face sided radio transmission device, or two face sided radio transmission devices. Claim 2, via its dependency on claim 1, recites in part, that the face support control system performs "wireless and cable-free bi-directional" data transmission in the end region of the face. As previously noted, the '099 patent fails to teach or even suggest that the communication between control devices in the face and the

master control outside the face is "wireless," "cable-free," and "bi-directional." The '099 patent entirely fails to teach or even suggest these aspects. In fact, if one followed the teachings of the '099 patent, one would be motivated to use a cable-based control system instead of a "cable-free" system as recited in claim 2. The '099 patent repeatedly teaches that a cable-based system be used by its description of cables 98 and 200, as previously described.

For at least these reasons, it is respectfully submitted that this ground of rejection be withdrawn.

C. Rejection of Claim 18 Under §103(a) Should Be Withdrawn

The Office contended in this regard:

Stolarczyk fails to teach the transmission station (i.e. the mining machine radio) provides communication between both the first and second communication devices (e.g. two distinct shield radios) and the mining machine.

Merriman teaches a radio (col. 2, line 30) transmission station for communicating between each shield radio and the mining machine. This provides the advantage of allowing the location of the mining machine to be determined (col. 2, line 14).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the Stolarczyk system to have the transmission station provides communication between the first and second communication devices and the mining machine as called for in claim 18; in order to facilitate locating the mining machine along the face.

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It is instructive to note several distinguishing differences between the '943 patent to Merriman and the subject matter of claim 18. The system of the '943 patent conveys data of a shearer in one direction, i.e. from the shearer. This one-way transmission of data is to only perform monitoring of the shearer. In contrast, the system as recited in claim 18, ultimately dependent from independent claim 13, utilizes "bi-directional" communication.

Furthermore, claim 18 through its dependency from claim 13, recites a mining system comprising, in part, a radio-based wireless and cable-free bi-directional communication system that provides radio communication between a communication device and the face master control. In contrast, the control system of the '943 patent is primarily cable-based! Although a small portion of the data path can be by infra-red (between infra-red transmitter 30 and receivers 32 in Fig. 3), the remaining path to a control unit (such as unit 28) and to a remote point (such as 34) at the mine surface, is via

cable. Thus, the control system taught by the '943 patent is not "wireless" and "cable-free" as recited in claim 18. Therefore, the '943 patent actually teaches away from the subject of claim 18.

Neither of the '099 patent nor the '943 patent, taken singularly or in combination, teach or suggest these aspects. For at least these reasons, it is respectfully requested that the rejection of claim 18 be withdrawn.

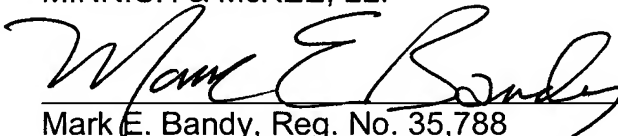
D. Conclusion

For the reasons detailed above, it is respectfully submitted all claims remaining in the application (Claims 1-18) are in condition for allowance.

Respectfully submitted,

FAY, SHARPE, FAGAN,
MINNICH & McKEE, LLP

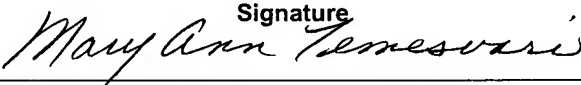
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Date


Mark E. Bandy, Reg. No. 35,788
1100 Superior Avenue, Seventh Floor
Cleveland, OH 44114-2579
216-861-5582

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